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ABSTRACT

This study was conducted to identify student and tutor variables related to student progress in a structured summer reading tutorial program. High school and college students and adults tutored individually 121 elementary and junior high school students for six weeks. Criterion variables were number of tutoring books completed, residual gain scores on six achievement measures (oral reading, spelling, word recognition, auditory discrimination-2, and visual-motor coordination), and two affective measures (self-esteem and locus of control). Independent variables were measures of student and tutor characteristics and tutor behaviors during tutoring. Step-wise multiple regression analyses and extreme-groups analyses are presented showing, respectively, the significant predictors of student progress and the tutor variables that significantly differentiated most and least effective tutors. (Author)

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STUDENT AND TUTOR VARIABLES RELATED TO STUDENT PROGRESS IN A READING TUTORIAL PROGRAM

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Student and Tutor Variables Related to Student Progress in a Reading Tutorial Program

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This study was conducted to identify student and tutor variables related to student progress in a structured summer reading tutorial program. High school and college students and adults individually tutored 121 elementary and junior high school students for six weeks. Criterion variables were number of tutoring books completed and residual gain scores on six achievement measures (oral reading, spelling, word recognition, auditory discrimination-2, and visual-motor coordination) and two affective measures (self-esteem and locus of control). Independent variables were measures of student and tutor characteristics and tutor behaviors during tutoring. Step-wise multiple regression analyses and extreme-groups analyses are presented showing, respectively, the significant predictors of student progress and tutor variables which significantly differentiated most and least effective tutors.

STUDENT AND TUTOR VARIABLES RELATED TO STUDENT PROGRESS IN A READING TUTORIAL PROGRAM

The use of individual or small group tutoring to provide remedial instruction has become increasingly popular since the 1960's. (See, for example, Bloom, undated; Blumenfeld, 1973; Conrad, 1975; Gartner et al., 1971; Thelen, 1969). The benefits attributed to tutoring programs have included improved academic achievement, self-esteem, attitudes toward school and social behavior of either students (e.g., Klema, 1965), tutors (e.g., Thelen, 1969), or both (e.g., Cloward, 1967). However, most evaluations of tutoring programs are anecdotal accounts rather than data studies.

Tutoring programs can be classified, regardless of other characteristics, as emphasizing one of two basic approaches. One approach emphasizes development of an open, non-structured relationship between the tutor and student, leaving considerable latitude for the tutor to determine the content of the tutoring sessions (e.g., Gartner et al., 1971; Shaw, 1973; Thelen, 1969). The other focuses on academic development of the students using carefully sequenced materials to teach specific skills (e.g., Ellson et al., 1965, 1968). Rosenshine and Furst (1969) concluded in their review that successful programs, that is those producing measurable achievement gains in students, are highly structured and cognitively oriented.

At the time this review was completed, there were still surprisingly few studies which had attempted to identify correlates of tutoring success other than structure--that is, the effectiveness of selection or matching criteria or student and tutor characteristics and behaviors related to student achievement.

Studies which have examined the relationships between student characteristics and academic improvement, have reported significant correlations for students' grade level, WISC IQ (verbal, performance, and full scale), and a measure of mental health (Krippner, 1970) and non-significant correlations between student achievement and the following student variables: sex, ethnicity, grade level, access to school programs in remediation, education and vocational aspirations, attitudes toward school, and attitudes toward socially approved acts (Cloward, 1967); initial scores on measures of self-concept, social desirability, and attitudes toward school (Glatter, 1967); a measure of self-concept (Boyd, 1969).

Studies which examined the relationships between student achievement and tutor characteristics have reported the following conflicting results: 1)age is significantly related (Hamblin & Hamblin, 1972), age is not significantly related (Salomon & Achenbach, 1974; Thomas, 1970); 2)achievement level is significantly related (Glatter, 1967) and is not significantly related (Conrad, 1975; Glatter, 1967); 3)both sex and ethnicity are related for some minority students (Cloward, 1967); sex but not ethnicity is significantly related for some minorities (Dahlem, 1973; Gentile, 1975); self-concept and anxiety are not significantly related (Glatter, 1967).

Some investigations of tutors' instructional behaviors have found that reinforcement that is contingent on student performance is more effective than noncontingent or no reinforcement (Conrad, 1975; Hamblin & Hamblin, 1972). Others have reported that contingency does not make a difference in student achievement (Brown, 1971; Snapp, Oakland & Williams, 1971; Zach, Horner & Kaufman, 1969). Studies of the effects of training tutors to demonstrate a number of behaviors (Harrison & Cohen, 1971) or to follow a script prescribing

these behaviors (Ellson et al., 1968) have reported that trained tutors produced significantly higher student achievement than untrained tutors.

Those studies which provide information on the criteria for selecting and matching students and tutors reflect a diversity of methods but seldom their effects (e.g., Allen & Feldman, 1963; Cloward, 1967; Erickson & Cromack, 1972; Landrum, 1970; Majors, 1971; Pope, 1971; Shaver & Nuhn, 1971; Snapp et al., 1972; Schoeller & Pearson, 1970).

Given the diversity of selecting and matching criteria and limited data on the effect of various tutor characteristics and behaviors on student achievement, the present study was planned to search for student and tutor variables related to student progress in a structured summer tutoring program.

METHOD

Program

The data for this study were collected at a six-week summer tutoring program in reading skills operated by the Reading Progress Center (RPC), a private, nonprofit organization in Metropolitan Atlanta. (For a detailed presentation of methodology, see Willey, 1976.) Students in the program were individually tutored for three 40-minute periods which were alternated with three 40-minute periods of group activities. (Auditory, Comprehension, and Perceptual-Motor skills) There were three group activity supervisors, each with two assistants and four tutor supervisors, each assigned approximately 18 tutors. Each tutor worked with two students, one younger and one older.

Students

The students enrolled in the program were not selected by any specific

criteria, except that the parent(s) wanted the child in the program and were able to either pay the tuition or provide another family member to tutor some other student in the program or receive one of 14 scholarships.

Of the 132 students enrolled in the program, complete data were collected on 121.

The students in the study were all Caucasian, 90 males and 31 females. Their ages ranged from 6 years 10 months to 14 years 2 months ($\bar{X}$=10 years 3 months); the range of grade completion was 1 thru 7 ($\bar{X}$ = 3.8); and intelligence test scores ranged from 57 to 130 ($\bar{X}$ = 99). The students represented a broad range of SES backgrounds, as well as abilities and scholastic achievement levels. The distribution of students by SES level is presented in Table 1 and the distribution of students by IQ and achievement-grade placement discrepancy in Table 2.

Tutors

The 70 tutors were 15 high school students, 17 college students, 27 parents of program participants, and 11 other adults from the community. All applicants were accepted. Of the total, 59 worked the full 4½ hours for six weeks and were paid $200, and 11, who were tutoring as part of the requirements for a local college education class, worked 3½ hours for six weeks and were paid $50. These 11 only tutored one student.

Seventeen of the 70 had tutored in at least one previous RPC program; 13 were employed as teachers or instructional assistants in local schools. Four tutors were male and 66 female; all were Caucasian except one Black male college student. Their ages ranged from 13 to 69 ($\bar{x}$ = 28.5); they had completed from 7 to 17 years of education ($\bar{x}$ = 12.9). They represented diverse SES backgrounds. The distribution of tutors by SES level is included in Table 1.

Table 1. Socioeconomic Status Distribution of Students and Tutors

Category	Students	Tutors
Professional & Technical	33	15
Managerial	26	19
Sales	18	15
Clerical	3	4
Skilled	34	15
Semiskilled	7	2
Total	121	70

Note. Distribution is based on 1970 Census, Classified Index of Industries and Occupations.

Table 2. Distribution of Students by IQ and Achievement-Grade Placement Discrepancy (in years).

	ACH<GP			GP<ACH			
IQ	2+	1-1.9	0-.9	0-.9	1-1.9	2+	TOT
<80	6	4	0	0	0	0	0
80-89	17	19	9	4	1	1	51
100-114	8	12	21	1	1	0	43
>115	5	3	5	3	0	1	17
TOT	36	38	35	8	2	2	121

Matching. Students and tutors were matched by the RPC directors. Their judgment about assignments was undoubtably influenced by factors which were not identifiable; however, they primarily relied on five rules:

1. No student was matched with a family member or friend of the family as tutor.
2. A family member was assigned to a student in a supervisor group other than the one in which his or her own child was placed.
3. A student was matched with a tutor from similar socioeconomic background to maximize common experiences and language patterns.
4. Male tutors were assigned to male participants.
5. Age was considered in some cases; e.g., older male students were not assigned to young female tutors.

Unfortunately, the program directors would not agree to random matching, since they were concerned that it would result in a number of incompatible pairs and that changing these would be disruptive. However, the matching criteria used may not have been particularly biasing. Rules 1 and 2 should not have any systematic effect on tutoring; there were more male students than male tutors so some had female tutors, although no female student had male tutors. Rule 5 only excluded junior high females from tutoring junior high males, and the correlation between student and tutor SES was not significant ($r=.1911$).

Training. All tutors attended two 5-hour orientation and training sessions. During training, the tutors were given explanations of the program procedures and activities, specific instruction in how to use the tutoring materials and general instruction in how to use reinforcement procedures with the students. The tutors were able to study the materials at home before they began tutoring.

Materials

All tutor-student pairs used the same set of tutoring materials; a sequence of ten books which presented word attack skills. Seven of the books were from the Patterns for Progress series (PFP) (Wheeler et al., 1971 a, b, c, d, e, f, g) and three of the books were from the APSL: Approach to Literacy series (Shedd

and Blankenship, 1967 a,b,c). Both series include a tutor's manual to accompany each student book. In the PFP books the tutor follows a sequence of steps printed in the tutor's manual. Tutors also used the PFP steps when using the APSL books.

In addition to the tutoring books, there were a number of commercial and tutor-made materials and games available for practicing skills.

Variables Measured

A list of all variables measured, the tests used and their abbreviations is presented in the Glossary. For a detailed description of the scoring procedures and copies of unpublished instruments, see Willey (1976).

Dependent Variables

The students were pre- and post-tested on six academic measures--oral paragraph reading, oral spelling, oral word reading, visual-motor integration, auditory discrimination(2), a self-concept measure and a locus-of-control measure. In addition, a seventh academic measure--number of tutoring books completed--was calculated for each student at the end of the program. The academic measures were those already in use by the program. Alternate forms were used for the measures of oral paragraph reading and oral spelling; the same form was used for pre- and post-tests of the other measures. The oral reading and spelling pretests were administered individually within two weeks of the beginning of the program and concluded by the second day of the program; their posttests were administered during the last three days of the program. The other measures were administered in small groups during the first and last two days of the program.

Independent Variables

Student characteristics. Twelve student variables were measured. Since there was not much evidence to guide the selection of variables, all data

available on the student application forms were included: age, sex, school system, grade just completed, number of parents at home, number of siblings, birth order, use of medication for hyperactivity, number of times the student previously had been enrolled in an RPC tutoring program, and SES of the student's family. The number of days the student was absent and IQ were the only additional variables included. During the first two weeks of the program, the Slosson Intelligence Test was given to 56 students who had not been administered an intelligence test in the preceding nine months.

Tutor characteristics. Data were obtained for 16 tutor-characteristic variables. Since little is known about the characteristics of successful tutors, a variety of measures were included. Eight variables were background data obtained from the tutors' application forms. Also, the number of tutor absences was recorded. In addition, tutors completed paper and pencil measures of the following variables: knowledge of phonics, level of empathy, attitudes about children and childrearing, attitudes about education, locus of control, self-concept, and personality. These variables were included because they previously have been considered important for successful tutors.

Tutor behaviors. During tutoring sessions, observers rated tutors individually on rapport and structure (high inference, 1-5 scale) and use of reinforcement procedures (low inference, combined time sampling/event recording procedure). These variables were included since all frequently have been considered important for tutoring success. Rapport was defined as warmth, supportiveness and ability to relate to the student. Since the structured tutoring materials scripted many instructional behaviors previously studied, structure was a rating of whether the tutor followed the instructional sequence of the books; reinforcement procedures which were not scripted were measured separately.

Each observation period was 3-5 minutes. Observers were trained in joint observer sessions. An acceptable level of agreement was reached during training on the low, but not high, inference categories. Some observers consistently rated higher than others. This problem was not satisfactorily resolved during training. All tutor-student pairs were observed at the beginning, middle and end of the program by two observers. The tutor supervisors also completed end of program ratings of tutor creativity and tutor use of reinforcement reported in daily notes.

ANALYSES AND RESULTS

Regression Analyses

Two types of analyses were performed--3 series of multiple regression analyses and extreme-groups analyses of most- and least-effective tutors. First, 3 series of stepwise multiple regression analyses were used to determine the contributions of student characteristic variables (STUDENT), tutor characteristic and behavior variables (TUTOR) and both (COMBO) to each criterion variable. A significance level of .05 was used for all regression analyses.

STUDENT Series

For each analysis in the STUDENT series, the posttest of one dependent variable was the criterion variable, the appropriate pretest measure was entered at step one, and the student independent variables were the predictor variables. The posttest measures of all other dependent variables were deleted. In analyses with an academic measure posttest as the criterion variable, pretests of the remaining academic measures were also deleted. In each of the analyses with NBOOKS, SEIPOS, and SLOCPOS as the criterion variable, all pretests were free to enter the regression equation, with SEIPRE and SLOCPRE entered at the first step in the latter two subproblems, respectively.

Means and standard deviations for the 12 STUDENT independent variables

are presented in Table 3. It can be seen from Table 3 that the means of the eight dependent variables on which students were pre- and posttested all changed in the desired direction.

The intercorrelations among all the variables are presented in Willey (1976). While all these correlations will not be discussed, those among the dependent variables are summarized below. The correlations among the academic pretest measures, which ranged from .36 to .90, and those among the academic posttest measures, which ranged from .28 to .94, were all significant ($p<.001$), with the lowest correlations being those between VMI and the other variables. The SEI pretest was significantly related to only one academic pretest measure, BIADII ($r=.15$, $p<.05$); the correlations of SEIPRE with the other academic pretests ranged from .06 to .14. However, SEIPOS was significantly related to all the academic posttest measures except VMIPOS ($r=.10$). The correlations with GORPOS, GSPOS, and SORPOS were .34, .37, and .33, respectively ($p<.001$). The correlations with the other three measures ranged from .22 to .28 ($p<.01$).

SLOCPRE was significantly related to all other pretest measures of dependent variables; the correlations with GSPRE, BIADI, and SEI were all -.26 ($p<.01$) and the values of the others ranged from -.28 to -.39 ($p<.001$). The correlations between SLOCPOS and the other posttest measures were also all significant; the correlations with VMIPOS and NBOOKS were -.21 ($p<.05$) and -.25 ($p<.01$), respectively. The remaining correlations ranged from -.28 to -.49 ($p<.001$).

Table 4 presents the results of the STUDENT series of regression analyses. Eight variables significantly contributed to the predictions of the criterion variables after pretest effects had been accounted for. Four of these were student independent variables, and four were pretests which contributed to

Table 3. Means and Standard Deviations of Dependent Variables and STUDENT Independent Variables

Variable	Mean	Standard Deviation
Dependent		
GORPRE	3.5685	1.5593
GORPOS	4.2264	1.5159
GSPRE	3.3561	1.2655
GSPOS	3.6231	1.2930
SORPRE	3.5222	2.1152
SORPOS	3.4140	2.2356
VMIPRE	97.2479	25.9835
VMIPOS	107.4380	30.0086
NBOOKS	3.1239	1.9079
BIADIPRE	42.1074	9.2814
BIADIPOS	48.6776	4.1976
BIADIIPRE	55.5454	24.4494
BIADIIPOS	70.6942	25.8976
SEIPRE	27.1735	6.1626
SEILE	4.5434	1.8393
SEIPOS	28.9338	7.5605
SEILO	5.1735	1.8915
SLOCPRE	17.5286	4.3909
SLOCPOS	16.8181	4.5698
Independent		
SEX-S	1.7355	0.4428
AGE-S	123.1404	21.7919
SCHOOL	1.8016	1.2885
GRADE	3.8595	1.7762
PARENT	1.9338	0.2495
SIB	2.2644	1.4342
BO	2.3057	1.3092
SES-S	3.0000	1.7320
RED	1.8595	0.3489
RPC	0.4710	0.7535
SIT	99.2562	14.7419
NDA-S	1.7603	2.5593

Table 4. Multiple Regression Analyses, STUDENT Variables

Step and Independent Variable	Multiple R	R^2	Increase in R^2	Beta	F
Dependent Variable: GORPOS					
1. GORPRE	0.9215	0.8491	0.8491	0.7328	669.709
2. GRADE	0.9341	0.8726	0.0235	0.2396	21.732
3. PARENT	0.9393	0.8822	0.0097	0.1051	9.596
4. SCHOOL	0.9436	0.8903	0.0081	0.0925	8.544
Dependent Variable: GSPOS					
1. GSPRE	0.8790	0.7727	0.7727	0.7671	404.458
2. SLOCPRE	0.8916	0.7949	0.0222	-0.1285	12.795
3. GRADE	0.8977	0.8058	0.0109	0.1330	6.567
Dependent Variable: SORPOS					
1. SORPRE	0.9640	0.9292	0.9292	0.9441	1562.751
2. SLOCPRE	0.9658	0.9238	0.0035	-0.0628	6.229
Dependent Variable: VMIPOS					
1. VMIPRE	0.5382	0.2897	0.2897	0.3289	48.526
2. GRADE	0.6534	0.4269	0.1372	0.4255	28.258
Dependent Variable: NBOOKS					
1. SORPRE	0.5823	0.3391	0.3391	0.5311	61.065
2. SLOCPRE	0.6023	0.3621	0.0236	-0.1619	4.366
Dependent Variable: BIADIPOS					
1. BIADIPRE	0.6246	0.3901	0.3901	0.5741	76.124
2. SIT	0.6490	0.4212	0.0311	0.1634	6.335
Dependent Variable: BIADIIPOS					
1. BIADIIPRE	0.8988	0.8078	0.8078	0.8988	500.220
Dependent Variable SEIPOS					
1. SEIPRE	0.5853	0.3426	0.3426	0.5499	62.004
2. SORPRE	0.6357	0.4041	0.0616	0.1857	12.195
3. SCHOOL	0.6552	0.4293	0.0252	0.1466	5.163
4. PARENT	0.6713	0.4507	0.0213	-0.1467	4.507
5. SLOCPRE	0.6849	0.4691	0.0184	-0.1478	3.993
Dependent Variable: SLOCPOS					
1. SLOCPRE	0.5549	0.3079	0.3079	0.4518	52.931
2. SEILE	0.5957	0.3548	0.0470	-0.2188	8.587
3. SEIPRE	0.6291	0.3957	0.0409	-0.2095	7.917

criterion variables other than their respective posttests. These eight variables and the dependent variables to which they contributed are summarized in Table 5.

TUTOR Series

For each analysis in the TUTOR series, the posttest of one dependent variable was the criterion variable, the appropriate pretest measure was entered at step one, and the tutor independent variables were the predictor variables. The pre- and post-test measures of all other dependent variables were deleted. Table 6 presents the means and standard deviations for the dependent variables and TUTOR independent variables.

Three of the TUTOR independent variables (CARCOM, TSOR-RAPO, and TSOR-STRU) were ratings on 5-point scales. The interrater reliabilities for these variables are presented in Table 7. The agreement of the two experts rating the tutors' written communication of empathy was substantial ($r=.93$); however, that of the observers rating the tutors on rapport and structure during tutoring, while significant ($p<.001$), was only moderate with correlations of .43 and .46 for TSOR-RAPO and TSOR-STRU, respectively. The results of the TUTOR series of regression analyses are presented in Table 8.

In summary, 22 tutor variables significantly contributed to the predictions of the criterion variables after the effects of the pretests had been taken into account. Five of these were ratings of tutor behaviors and the rest were measures of tutor characteristics. These tutor variables and the criterion variables to which they contributed are summarized in Table 9.

COMBO Series

For each analysis in the COMBO series, the posttest of one dependent variable was the criterion variable, the appropriate pretest measure was entered at step one, and the predictor variables were a combination of the student

Table 5. Summary of Increases in R^2 Contributed by STUDENT Variables for Each Dependent Variable (After Pretest Effects Were Taken into Account)

Independent Variable	Dependent Variable									
	GORPOS	GSPOS	SORPOS	VMIPOS	NBOOKS[a]	BIADIPOS	BIADIIPOS	SEIPOS	SLOCPOS	TOT[b]
SCHOOL	.0081							.0252		2
GRADE	.0235	.0109		.1372						3
PARENTS	.0097							.0213		2
SIT						.0311				1
SEIPRE									.0409	1
SEILE									.0470	1
SLOCPRE		.0222	.0035		.0236			.0184		4
SORPRE					.3391			.0616		2
Tot R^2 for DV accounted for by IV's	.0413	.0331	.0035	.1372	.3627	.0311	---	.1265	.0879	

[a] There was no pretest for this variable.

[b] This column indicates the total number of dependent variables to which the independent variable contributed.

Table 6. Means and Standard Deviations of Dependent Variables and TUTOR Independent Variables

Variable	Mean	Standard Deviation
Dependent		
CORPRE	3.5685	1.5593
CORPOS	4.2264	1.5159
GSPRE	3.3561	1.2655
GSPOS	3.6231	1.2930
SORPRE	3.5222	2.1152
SORPOS	3.9140	2.2356
VMIPRE	97.2479	25.9835
VMIPOS	107.4380	30.0086
MBOOKS	42.1239	1.9074
BIADIPRE	42.1074	2.2814
BIADIPOS	48.6776	4.1976
BIADIIPRE	55.5454	24.4494
BIADIIPOS	27.1735	6.1626
SEIPRE	27.1735	6.1626
SEIPOS	28.9338	7.5605
SLOCPRE	17.5206	4.4909
SLOCPOS	16.8181	4.5698
Independent		
AGE-T	28.4793	11.3776
SEX-T	1.0413	0.1998
MS	1.6528	0.5433
SES-T	1.8760	1.5360
EDCOM	12.8595	2.2147
CAT	2.6942	1.4539
EXPER	0.3471	0.7036
NDAT	1.1900	1.7809
PHONE	24.0991	5.8813
PARI-DEM	82.0165	8.3495
PARI-ACC	30.4380	7.3118
PARI-AUT	71.0826	7.2416
TLOC	8.6363	4.5210
ESVII-A	5.3465	0.6835
ESVII-B	4.7166	0.7519
ESVII-A-B	0.6289	0.9310
CARDIS	2.2871	0.4030
CARCOMA	1.2704	0.2904
CARCOMB	1.1611	0.2918
CARCOMAB	1.2179	0.2856
16PF-A	5.0495	1.6575
16PF-B	6.7933	1.9447
16PF-C	5.2314	1.4535
16PF-E	5.1487	1.7495
16PF-F	5.2479	1.5235
16PF-G	5.4958	1.9153
16PF-H	5.8099	1.8722
16PF-I	5.3140	1.6932
16PF-L	5.5867	2.2161
16PF-M	6.0661	1.5584
16PF-N	5.5371	1.9106
16PF-O	5.8512	1.6515
16PF-Q1	6.0661	1.7303
16PF-Q2	5.8264	1.6415
16PF-Q3	5.6942	2.0200
16PF-Q4	5.3471	1.5259
16PF-DSQ1	5.0891	1.5669
16PF-DSQ2	5.4867	1.4480
16PF-DSQ3	5.3032	1.7133
16PF-DSQ4	5.7462	1.2362
TSC-PHYS	68.6694	7.9941
TSC-ME	73.8347	8.1591
TSC-PERS	66.5371	8.3606
TSC-FAM	71.8429	8.1649
TSC-SOC	69.2231	8.4443
TSC-IDEN	128.4214	9.3752
TSC-SAT	107.5537	14.3801
TSC-BEH	114.0495	12.3812
TSC-TOT	350.1074	32.5166
TSC-SC	35.6942	5.6669
TSOR-RAPOA	3.1570	0.7611
TSOR-RAPOB	3.5388	0.5401
TSOR-RAPOAB	3.3098	0.5720
TSOR-STRUA	3.6652	0.5529
TSOR-STRUB	3.6297	0.5619
TSOR-STRUAB	3.6230	0.4744
TSOR-PKR	0.5209	0.8667
TSOR-PSR	4.6115	1.1282
TSOR-AD	0.3801	0.9596
TSOR-CCD	2.6281	1.5062
TSOR-IGN	0.1157	0.4121
SR-UMR	1.1570	0.3653
SR-TC	3.8099	0.9337

Table 7. Interrater reliabilities for CARCOM, TSOR-RAPO, and TSOR-STRU.

	CARCOMA	CARCOMB	CARCOMAB
CARCOMA	1.0000	.9302	.9828
CARCOMB		1.0000	.9819
CARCOMAB			1.0000

	RAPOA	RAPOB	RAPOAB
RAPOA	1.0000	.4320	.8996
RAPOB		1.0000	.7669
RAPOAB			1.0000

	STRUA	STRUB	STRUAB
STRUA	1.0000	.4614	.8538
STRUB		1.0000	.8531
STRUAB			1.0000

Table 8. Multiple Regression Analyses, TUTOR Variables

Step and Independent Variable	Multiple R	R^2	Increase in R^2	Beta	F
Dependent Variable: GOMPOS					
1. GOMPRE	0.9215	0.8491	0.8491	0.9320	669.709
2. TSC-PERS	0.9263	0.8580	0.0088	0.0917	7.351
3. MSVII-B	0.9299	0.8648	0.0068	-0.0823	5.907
4. 16PF-E	0.9324	0.8732	0.0084	-0.1007	7.645
5. 16PF-Q4	0.9369	0.8778	0.0046	0.0711	4.367
Dependent Variable: GSPOS					
1. GSPRE	0.8790	0.7727	0.7727	0.8790	404.458
Dependent Variable: SORPOS					
1. SORPRE	0.9640	0.9292	0.9292	0.9388	1562.751
2. 16PF-H	0.9664	0.9339	0.0047	0.0591	8.334
3. TSOR-CCD	0.9678	0.9367	0.0028	-0.0584	5.088
Dependent Variable: VMIPOS					
1. VMIPRE	0.5382	0.2897	0.2897	0.5633	48.526
2. CAT	0.5640	0.3181	0.0284	0.1935	4.921
3. 16PF-F	0.5838	0.3408	0.0227	-0.1544	4.034
Dependent Variable: NBOOKS					
1. PHONQ	0.2440	0.0576	0.0576	0.2482	7.275
2. 16PF-F	0.3024	0.0915	0.0339	0.1842	4.990
Dependent Variable: BIADIPOS					
1. BIADIPRE	0.6246	0.3901	0.3901	0.5979	76.124
2. TSOR-IGN	0.6634	0.4401	0.0500	-0.2252	10.531
Dependent Variable: BIADIIPOS					
1. BIADIIPRE	0.8988	0.8078	0.8078	0.9047	500.220
2. 16PF-Q4	0.9034	0.8161	0.0083	-0.1058	5.206
3. PARI-DEM	0.9082	0.8249	0.0088	0.1065	5.852
4. TSC-PAM	0.9128	0.8331	0.0083	-0.0980	5.747
5. SR-UMR	0.9169	0.8407	0.0076	-0.1090	5.461
6. 16PF-A	0.9209	0.8480	0.0074	0.0887	5.521
Dependent Variable: SEIPOS					
1. SEIPRE	0.5853	0.3426	0.3426	0.5619	62.004
2. EDCOM	0.6074	0.3689	0.0264	0.2114	4.932
3. PARI-AUT	0.6313	0.3985	0.0296	0.1515	5.754
4. 16PF-DSQ3	0.6469	0.4185	0.0200	0.1443	3.981
Dependent Variable: SLOCPOS					
1. SLOCPRE	0.5549	0.3079	0.3079	0.5043	52.931
2. 16PF-I	0.6044	0.3653	0.0574	-0.2765	10.680
3. TSOR-PMR	0.6347	0.4028	0.0375	0.1987	7.344
4. TSOR-AD	0.6571	0.4318	0.0290	-0.1861	5.926
5. SES-T	0.6812	0.4641	0.0323	0.1991	6.921
6. PARI-ACC	0.6950	0.4831	0.0190	-0.1406	4.186

Table 9. Summary of Increases in R^2 Contributed by TUTOR Variables for Each Dependent Variable (After Pretest Effects Were Taken into Account)

Independent Variable	Dependent Variable									
	GORPOS	GSPOS	SORPOS	VNIPOS	NBOOKS[a]	BIADIPOS	BIADIIPOS	SEIPOS	SLOCPOS	TOT[b]
SES-T									.0323	1
EDCOM								.0264		1
CAT				.0284						1
PHONQ					.0576					1
PARI-DEM							.0088			1
PARI-ACC									.0190	1
PARI-AUT								.0296		1
ESVII-B	.0068									1
16PF-A							.0074			1
16PF-E	.0084									1
16PF-F				.0227	.0339					2
16PF-H			.0047							1
16PF-I									.0574	1
16PF-Q4	.0046						.0083			2
16PF-DSQ3								.0200		1
TSC-PERS	.0088									1
TSC-FAM							.0083			1
TSOR-PMR									.0375	1
TSOR-AD									.0290	1
TSOR-CCD			.0028							1
TSOR-IGN						.0500				1
SR-UMR							.0076			1
Tot R^2 for DV accounted for by IV's	.0286	---	.0075	.0511	.0915	.0500	.0404	.0760	.1752	

[a] There was no pretest for this variable.

[b] This column indicates the total number of dependent variables to which the independent variable contributed.

and tutor independent variables which had been significant predictors of the criterion variables in the STUDENT and TUTOR series plus 15 additional selected variables. SIB was included since its partial correlation with BIADJIPOS had an F-value just below that necessary for inclusion in the equation, and no STUDENT variables had been significant predictors of BIADJIPOS. All the tutor rapport measures (CARDIS, CARCOMA, CARCOMB, CARCOMAB) and all the observation measures, as well as ESVII-A, ESVII-A-B, and TSC-IDEN were included since several of these had large partial correlations with various criterion variables when the F-levels were insufficient for further computation. The pattern of deletions of pre- and posttest measures of the other dependent variables in each analysis was the same as for the STUDENT series. Table 10 presents the means and standard deviations of the dependent variables and the independent variables included in the COMBO series. The results of the COMBO series of regression analyses are presented in Table 11.

A total of 29 student and tutor variables significantly contributed to the predictions of the criterion variables, after the pretest effects had been accounted for in the COMBO analyses. Nine of these were student variables, 14 were tutor characteristic variables, and six were tutor behavior variables. These 29 variables and the dependent variables to which they contributed are summarized in Table 12.

Summary

The results of these analyses indicate that the largest proportion of the variance in the students' achievement at the end of the tutoring program was explained by their entering achievement levels. For the dependent variables that yielded standardized measures of reading and spelling achievement, the respective pretest scores accounted for 85% of the Gates oral reading posttest

Table 10. Means and Standard Deviations of Dependent Variables and COMBO Independent Variables

Variable	Mean	Standard Deviation
Dependent		
GORPRE	3.5685	1.3593
GORPOS	4.2264	1.3139
GSPRE	3.3561	1.2655
GSPOS	3.6231	1.2930
SORPRE	3.5222	2.1152
SORPOS	3.9140	2.2356
VMIPRE	97.2479	24.9835
VMIPOS	107.4380	30.0086
NBOOKS	3.1239	1.9079
BIADIPRE	42.1074	9.2814
BIADIPOS	48.6776	4.1976
BIADIIPRE	55.5454	24.4494
BIADIIPOS	70.6942	25.8976
SEIPRE	27.1735	6.1626
SEILE	4.3454	1.8393
SEIPOS	28.9338	7.5605
SEILO	5.1735	1.8914
SLOCPRE	17.5206	4.4909
SLOCPOS	16.8181	4.5698
Independent		
SCHOOL	1.8016	1.2885
GRADE	3.8595	1.7762
PARENT	1.9338	0.2495
SIB	2.2644	1.4362
SIT	99.2562	14.7419
SES-T	2.8760	1.5360
EDCOM	12.8595	2.2147
CAT	2.6942	1.4539
PHONE	24.0991	5.8813
PARI-DEM	82.0165	8.3495
PARI-ACC	30.4380	7.3118
PARI-AUT	71.0826	7.2416
ESVII-A	5.3465	0.6851
ESVII-B	4.7166	0.7519
ESVII-AB	0.6289	0.9310
CARDIS	2.2871	0.4030
CARCOMA	1.2704	0.2204
CARCOMB	1.1611	
CARCOMAB	1.2179	
16PF-A	5.0495	1.6575
16PF-H	5.1487	1.7495
16PF-P	5.2479	1.5235
16PF-H	5.8099	1.8722
16PF-I	5.3140	1.6932
16PF-Q4	5.3471	1.5259
16PF-DSQ3	5.3032	1.7133
TSC-PERS	66.5371	8.3606
TSC-FAM	71.8429	8.1649
TSC-IDEN	128.4214	9.3752
TSOR-RAPOA	3.1570	1.9079
TSOR-RAPOB	3.5388	0.5401
TSOR-RAPOAB	3.3098	0.5720
TSOR-STRUA	3.6652	0.5529
TSOR-STRUP	3.6297	0.5619
TSOR-STRUAB	3.6239	0.4744
TSOR-PMR	0.5289	0.8667
TSOR-PSR	4.6115	1.1282
TSOR-AD	0.3801	0.9596
TSOR-CCD	2.6281	1.5062
TSOR-IGN	0.1157	0.4121
SR-UMR	1.1570	0.3653

Table 11. Multiple Regression Analyses, COMBO Variables

Step and Independent Variable	Multiple R	R^2	Increase in R^2	Beta	F
Dependent Variable: GORPOS					
1. GORPRE	0.9215	0.8491	0.8491	0.7509	669.705
2. GRADE	0.9341	0.8726	0.0235	0.2213	21.732
3. PARENT	0.9393	0.8822	0.0097	0.1099	9.596
4. SCHOOL	0.9436	0.8903	0.0081	0.0833	8.544
5. ESVII-B	0.9471	0.8970	0.0067	-0.0724	7.441
6. 16PF-E	0.9515	0.9054	0.0084	-0.0986	10.170
7. 16PF-Q4	0.9541	0.9102	0.0048	0.0834	6.023
8. TSC-PERS	0.9561	0.9142	0.0040	0.0663	5.184
Dependent Variable: GSPOS					
1. GSPRE	0.8790	0.7727	0.7727	0.7671	404.460
2. SLOCPRE	0.8916	0.7949	0.0222	-0.1285	12.795
3. GRADE	0.8977	0.8058	0.0109	0.1330	6.560
Dependent Variable: SORPOS					
1. SORPRE	0.9640	0.9292	0.9292	0.9423	1562.787
2. 16PF-H	0.9664	0.9339	0.0047	0.0614	8.334
3. TSOR-CCD	0.9678	0.9367	0.0028	-0.0548	5.068
4. SIB	0.9689	0.9388	0.0021	-0.0463	4.034
Dependent Variable: VMIPOS					
1. VMIPRE	0.5382	0.2897	0.2897	0.3565	48.526
2. GRADE	0.6534	0.4269	0.1372	0.4206	28.252
3. CAT	0.6721	0.4517	0.0248	0.1826	5.268
4. 16PF-F	0.6891	0.4748	0.0231	-0.1558	5.110
Dependent Variable: NBOOKS					
1. SORPRE	0.5823	0.3391	0.3391	0.5516	61.065
2. TSOR-RAPOAB	0.6088	0.3707	0.0316	-0.2171	5.917
3. SLOCPRE	0.6380	0.4070	0.0363	-0.2047	7.171
Dependent Variable: BIADIPOS					
1. BIADIPRE	0.6246	0.3901	0.3901	0.5510	76.124
2. TSOR-IGN	0.6634	0.4401	0.0500	-0.2178	10.539
3. SIT	0.6840	0.4679	0.0277	0.1735	6.100
Dependent Variable: BIADIIPOS					
1. BIADIIPRE	0.8988	0.8078	0.8078	0.9047	500.220
2. 16PF-Q4	0.9034	0.8161	0.0083	-0.1058	5.306
3. PARI-DEM	0.9082	0.8249	0.0088	0.1065	5.852
4. TSC-FAM	0.9128	0.8331	0.0083	-0.0980	5.747
5. SR-UMR	0.9169	0.8407	0.0076	-0.1090	5.461
6. 16PF-A	0.9209	0.8480	0.0074	0.0887	5.521
Dependent Variable: SEIPOS					
1. SEIPRE	0.5853	0.3426	0.3426	0.5372	62.004
2. SORPRE	0.6357	0.4041	0.0616	0.1905	12.195
3. SCHOOL	0.6552	0.4293	0.0252	0.1720	5.163
4. TSOR-AD	0.6729	0.4528	0.0235	0.1480	4.972
5. 16PF-DSQ3	0.6872	0.4722	0.0194	0.1399	4.229
Dependent Variable: SLOCPOS					
1. SLOCPRE	0.5549	0.3079	0.3079	0.4231	52.931
2. 16PF-I	0.6044	0.3653	0.0574	-0.2871	10.680
3. SEILE	0.6519	0.4250	0.0597	-0.2141	12.154
4. SEIPRE	0.6775	0.4590	0.0339	-0.1702	7.272
5. SES-T	0.6951	0.4832	0.0242	0.1890	5.388
6. TSOR-AD	0.7131	0.5085	0.0253	-0.1749	5.865
7. PARI-ACC	0.7308	0.5341	0.0256	-0.1500	6.217
8. TSOR-PMR	0.7420	0.5506	0.0165	0.1351	4.111

Table 12. Summary of Increases in R^2 Contributed by COMBO Variables for Each Dependent Variable (After Pretest Effects Were Taken into Account)

Independent Variable	Dependent Variable									
	GORPOS	GSPOS	SORPOS	VMIPOS	NBOOKS[a]	BIADIPOS	BIADIIPOS	SEIPOS	SLOCPOS	TOT[b]
SCHOOL	.0081							.0252		2
GRADE	.0235	.0109		.1372						3
PARENTS	.0097									1
SIB			.0021							1
SIT						.0277				1
SORPRE					.3391			.0616		2
SEIPRE									.0339	1
SFILE									.0597	1
SLOCPRE		.0222			.0363					2
SES-T									.0242	1
CAT				.0248						1
PARI-DEM							.0088			1
PARI-ACC									.0256	1
ESVII-B	.0067									1
16PF-A							.0074			1
16PF-E	.0084									1
16PF-F				.0231						1
16PF-H			.0047							1
16PF-I									.0574	1
16PF-Q4	.0048						.0083			2
16PF-DSQ3								.0194		1
TSC-PERS	.0040									1
TSC-FAM							.0083			1
TSOR-RAPOAB					.0316					1
TSOR-PMR									.0165	1
TSOR-AD								.0235	.0253	2
TSOR-CCD			.0028							1
TSOR-IGN						.0500				1
SR-UMR							.0076			1
Tot R^2 for DV accounted for by IV's	.0652	.0331	.0096	.1851	.0679	.0779	.0404	.1297	.2426	

[a] There was no pretest for this variable.

[b] This column indicates the total number of dependent variables to which the independent variable contributed.

scores, 77% of the Gates oral spelling posttest scores, and 93% of the Slosson oral reading posttest scores. For the two nonstandardized tests of phonics skills similar to the skills being learned in the program, the BIADI pretest scores accounted for 40% of the posttest scores and the BIADII pretest scores accounted for 81% of the posttest scores. For the VMI, a much smaller proportion of the posttest scores (29%) was explained by the pretest scores than for the other standardized tests. This result may in large part be due to the degree of subjective judgment involved in the scoring of the VMI, especially since different individuals scored the pre- and posttests. Although NBOOKS had no pretest, 34% of the differences in number of books completed was accounted for the the pretest scores on the SORT, the test which most directly measured the application of the skills being taught in the books. For the two nonacademic measures, 34% of the self-esteem posttest scores and 31% of the locus of control posttest scores could be explained by the respective pretest scores.

The student and tutor variables included in this study accounted for only small amounts of the achievement differences at the end of the program. The student variables were of less interest than the tutor variables from the point of view of developing effective tutoring programs, since most of these student characteristics are not changeable. However, some of them were known to influence achievement and it seemed important that they be taken into account in order to obtain a more accurate picture of the contributing tutor variables. For example, by examining the contributions of the student and tutor variables separately, then in combination, it was possible to determine if the student characteristics included in the study affected the contributions of the tutor variables.

For six of the dependent variables, GORPOS, CSPOS, VMIPOS, BIADIPOS, BIADIIPOS, and SLOCPOS, there was no change in the student and tutor predictor variables from the separate to the combined analyses; the contributions from the two sets of variables were essentially additive, suggesting that the tutor variable contributions were the same regardless of the characteristics of the student being tutored.

However, there were changes from the individual to the combined analyses in the student predictor variables for SORPOS, in the tutor predictor variables for NBOOKS, and in both for SEIPOS, suggesting that different student and tutor characteristics have different effects depending on their combination in the pairing of students and tutors.

The student and tutor variables contributed more to the explanation of SEI and SLOC differences than to differences in any of the academic measures, except the VMI. The COMBO variables nearly doubled the amount of SLOCPOS that could be accounted for by the pretest alone.

These findings indicate that the student and tutor variables had little effect on performance on the measures of the reading skills which were the direct focus of the tutoring. Little of the variation in achievement not accounted for by the pretests could be attributed to the tutor variables measured in this study. Apparently, either the tutors had little effect or the tutor variables which had any sizeable effect on student scores were not among those measured.

Extreme-Groups Analyses

In the second type of analyses, groups of most and least effective tutors were identified for each dependent variable. The 10 tutors whose two students had the largest mean residual gain scores and the 10 tutors whose two students

had the smallest mean residual gain scores were the most and least effective tutors, respectively. Only the 51 tutors with two students were included in these analyses.

Different tutors were in the extreme groups on each dependent variable. In fact, every tutor except one was in an extreme group at least once. The frequency with which each tutor was in the extreme groups is presented in Table 13; academic measures were tallied separately from SEI and SLOC. It is clear from Table 13 that no tutors were consistently the most or least effective on all measures; although, some tutors were in the extreme groups far more frequently than others (e.g., tutors 9, 19, 21, 34, 47). It can also be seen that many tutors who were among the most effective for some dependent variables were among the least effective for others.

As another measure of tutor consistency, Pearson product-moment correlations were calculated between the residual gain scores for each tutor's two students. (For NBOOKS the correlation of actual number of books completed was calculated, since this variable had no pretest.) These results are presented in Table 14. All of the correlations were low, indicating there was little relationship between the tutors' effectiveness with the two students.

Differences between the groups of most and least effective tutors for each dependent variable were further examined using *t*-tests. The groups were compared using their mean scores on 25 tutor variables which had been significant predictors in the regression analyses. The results of these *t*-tests are presented in Tables 15-19. Significance levels of .10 or less are identified.

In summary, 19 tutor variables were found on which most and least effective tutors significantly differed for at least one of the dependent variables. These variables, the direction of the differences, and the significance levels

Table 13. Frequency Count for Tutors in Extreme Groups

Tutor	Seven Academic Dependent Variables		SEI and SLOC	
	Most Effective	Least Effective	Most Effective	Least Effective
1	3	1	0	0
2	1	3	0	1
3	1	3	0	1
4	2	2	1	0
5	2	1	0	1
6	1	1	0	0
7	0	2	0	1
8	2	2	0	1
9	5	0	0	0
10	1	2	0	1
11	1	1	0	0
12	1	1	0	0
13	1	2	1	0
14	1	0	0	0
15	1	1	1	0
16	3	0	0	0
17	0	3	1	0
18	0	1	0	2
19	0	4	0	0
20	1	2	0	0
21	4	0	2	0
22	1	1	0	1
23	2	0	1	0
24	1	3	1	1
25	2	0	0	2
26	2	2	0	0
27	2	0	1	0
28	1	0	2	0
29	0	2	1	0
30	2	1	1	0
31	3	1	0	0
32	1	0	0	0
33	1	2	0	1
34	4	1	2	0
35	2	1	0	1
36	0	2	0	0
37	0	1	0	1
38	2	0	1	0
39	1	2	0	0
40	0	2	0	0
41	3	1	1	0
42	0	3	0	0
43	1	2	1	0
44	1	2	0	2
45	0	2	0	2
46	1	1	0	0
47	1	4	0	1
48	0	0	0	0
49	3	1	1	0
50	0	0	1	0
51	3	1	0	1

Table 14. Correlations Between the Residual Gain Scores of the Tutors' Two Students.

	S_1		S_2
OOR			
mean	-.17		.17
s.d.	.46		.66
r		.03	
OS			
mean	-.11		.11
s.d.	.40		.79
r		-.25	
SOR*			
mean	-.06		.10
s.d.	.50		.62
r		-.11	
VNI			
mean	-10.48		5.22
s.d.	19.32		24.84
r		-.14	
NBOOKS[a]			
mean	2.36		3.74
s.d.	1.12		1.77
r		.09	
BIADI			
mean	.13		.17
s.d.	3.49		2.55
r		.01	
BIADII			
mean	5.73		-1.75
s.d.	8.36		10.03
r		.09	
SEI			
mean	-.98		1.21
s.d.	6.15		5.88
r		.07	
SLOC			
mean	-.73		1.10
s.d.	3.55		3.69
r		-.15	

[a] The correlation for NBOOKS was for the actual number of books completed; there were no residual gain scores, since this variable had no pretest.

Table 15. Extreme Groups, GOR and GS Residuals, t-Tests

	GOR Residuals Most Effective	GOR Residuals Least Effective	GS Residuals Most Effective	GS Residuals Least Effective
SES-T				
mean	2.70	2.80	2.60	3.60
s.d.	1.62	1.60	1.02	1.69
t-value	-.13		-1.52	
EDCON				
mean	12.70	11.80	12.60	11.80
s.d.	1.95	2.44	2.11	1.40
t-value	.86		.55	
CAT				
mean	2.00	3.20	2.70	2.80
s.d.	1.18	1.66	1.68	1.66
t-value	-1.77*		-.13	
PHONQ				
mean	25.00	22.80	25.10	20.90
s.d.	4.88	8.05	5.01	3.36
t-value	.70		2.09*	
PARI-DEM				
mean	85.40	82.50	86.20	83.20
s.d.	10.15	7.67	7.10	6.42
t-value	.68		.94	
PARI-ACC				
mean	32.00	27.40	30.50	31.60
s.d.	3.22	4.13	4.70	3.26
t-value	2.63**		-.58	
PARI-AUT				
mean	70.40	74.90	72.70	71.20
s.d.	5.61	4.01	8.10	6.23
t-value	-1.96*		.44	
ESVII-B				
mean	4.52	4.85	4.70	4.88
s.d.	.56	.73	1.01	.81
t-value	-1.08		-.41	
CARCOMAB				
mean	1.37	1.14	1.21	1.16
s.d.	.31	.10	.14	.11
t-value	1.32		.89	
16PF-A				
mean	4.60	6.10	4.60	5.80
s.d.	2.01	2.77	1.28	1.89
t-value	-1.31		-1.58	
16PF-E				
mean	4.10	6.20	5.00	5.10
s.d.	1.51	1.78	1.61	1.64
t-value	-2.70***		-.13	
16PF-F				
mean	4.70	6.50	6.20	6.00
s.d.	.64	1.50	1.33	1.26
t-value	-3.31***		.33	
16PF-H				
mean	5.80	6.50	5.80	6.90
s.d.	.98	1.50	.75	2.02
t-value	-1.17		-1.53	
16PF-I				
mean	5.40	5.40	5.50	4.50
s.d.	1.91	2.37	1.86	1.69
t-value	0		1.20	

	GOR Residuals Most Effective	GOR Residuals Least Effective	GS Residuals Most Effective	GS Residuals Least Effective
16PF-Q4				
mean	5.30	4.90	5.90	5.20
s.d.	1.49	1.46	1.45	1.75
t-value	.58		1.10	
16PF-DSQ3				
mean	4.19	6.48	5.23	6.78
s.d.	1.51	1.81	1.55	1.70
t-value	-2.91***		-2.02*	
TSC-PMS				
mean	72.70	65.80	70.20	65.60
s.d.	7.27	8.92	9.36	6.81
t-value	1.80*		1.19	
TSC-PAF				
mean	75.20	70.20	74.10	73.00
s.d.	5.11	7.29	7.41	6.59
t-value	1.68		.33	
TSOR-RAPOAB ($\overline{S_1+S_2}$)				
mean	3.22	3.31	3.54	3.52
s.d.	.63	.32	.35	.42
t-value	-.36		.14	
TSOR-STRUAP ($\overline{S_1+S_2}$)				
mean	3.59	3.44	3.74	3.76
s.d.	.27	.34	.32	.40
t-value	1.02		-.15	
TSOR-PMR ($\overline{S_1+S_2}$)				
mean	.55	.75	.40	.45
s.d.	.47	.68	.49	.52
t-value	-.72		-.21	
TSOR-PSR ($\overline{S_1+S_2}$)				
mean	4.60	4.60	5.05	5.00
s.d.	.94	.49	.57	1.02
t-value	0		.13	
TSOR-AD ($\overline{S_1+S_2}$)				
mean	.20	.15	.15	0
s.d.	.40	.23	.45	0
t-value	.33		1.00	
TSOR-CCD ($\overline{S_1+S_2}$)				
mean	2.50	2.35	2.35	2.45
s.d.	1.28	1.00	1.03	1.31
t-value	.28		-.18	
TSOR-IGN ($\overline{S_1+S_2}$)				
mean	.05	.05	0	0
s.d.	.15	.15	0	0
t-value	0		0	

Note. N=10 for each group.

*p<.10
**p<.05
***p<.02
****p<.01

Table 16. Extreme Groups, SORT and VMI Residuals, t-Tests

	SORT Residuals		VMI Residuals	
	Most Effective	Least Effective	Most Effective	Least Effective
SPS-T				
mean	2.00	3.60	2.50	3.40
s.d.	1.22	1.50	1.28	1.43
t-value	-2.33**		-1.41	
TDCOM				
mean	13.40	11.70	11.90	12.10
s.d.	2.29	1.55	2.95	1.70
t-value	1.84*		-.18	
CAT				
mean	2.80	2.80	3.90	1.60
s.d.	1.08	1.72	1.37	.70
t-value	0		3.78***	
PNORQ				
mean	24.20	24.40	28.70	21.80
s.d.	4.58	2.58	5.85	4.94
t-value	-.11		2.70**	
PARI-DEM				
mean	86.60	81.50	81.40	76.40
s.d.	6.84	9.76	4.03	7.31
t-value	1.28		1.80*	
PARI-ACC				
mean	29.30	30.60	29.30	29.60
s.d.	4.67	3.41	5.35	3.88
t-value	-.67		-.14	
PARI-AUT				
mean	74.70	74.50	73.10	75.20
s.d.	6.72	9.82	7.41	7.76
t-value	-.71		-.59	
RSVII-B				
mean	4.61	4.85	4.25	4.70
s.d.	.70	.95	.77	.69
t-value	-.62		-1.29	
CARCOMAB				
mean	1.17	1.11	1.27	1.17
s.d.	.15	.07	.36	.11
t-value	1.25		.77	
16PF-A				
mean	4.20	4.90	5.50	6.00
s.d.	1.66	.83	1.43	2.79
t-value	-1.13		-.48	
16PF-E				
mean	5.20	5.20	5.30	4.60
s.d.	1.60	.75	1.10	1.50
t-value	0		1.13	
16PF-F				
mean	5.60	4.80	4.50	5.30
s.d.	1.62	.98	1.28	1.35
t-value	1.26		-1.29	
16PF-H				
mean	6.90	5.60	6.10	5.60
s.d.	1.92	1.36	.70	1.20
t-value	1.66		1.08	
16PF-I				
mean	5.80	4.70	5.10	5.90
s.d.	1.66	1.10	1.37	1.70
t-value	1.66		-1.10	
16PF-Q4				
mean	4.90	5.00	4.60	5.30
s.d.	1.58	1.18	1.36	1.19
t-value	-.15		-1.16	
16PF-DSQ3				
mean	5.76	5.31	5.20	4.89
s.d.	1.39	1.81	1.43	2.12
t-value	.59		.36	
TSC-PFRS				
mean	69.10	67.10	71.30	65.90
s.d.	8.40	8.94	4.83	8.42
t-value	.49		1.70	
TSC-PAF				
mean	71.90	70.60	72.60	73.40
s.d.	7.11	5.70	4.34	8.27
t-value	.76		-.26	
TSOR-RAPOAB ($\overline{S_1+S_2}$)				
mean	3.49	3.34	3.48	3.24
s.d.	.39	.38	.48	.62
t-value	.63		.94	
TSOR-STRUAB ($\overline{S_1+S_2}$)				
mean	3.66	3.72	3.68	3.63
s.d.	.31	.28	.45	.36
t-value	-.43		-.26	
TSOR-PHR ($\overline{S_1+S_2}$)				
mean	.70	.55	.50	.35
s.d.	.71	.69	.81	.39
t-value	.45		.50	
TSOR-HSR ($\overline{S_1+S_2}$)				
mean	4.80	4.90	4.60	5.10
s.d.	.78	.77	.86	.83
t-value	.72		-1.25	
TSOR-AD ($\overline{S_1+S_2}$)				
mean	.30	.75	.40	.05
s.d.	.51	1.50	.58	.15
t-value	-.85		1.74*	
TSOR-CCD ($\overline{S_1+S_2}$)				
mean	2.45	2.65	2.10	3.60
s.d.	1.13	1.27	1.36	.73
t-value	-.35		-2.92****	
TSOR-IGN ($\overline{S_1+S_2}$)				
mean	0	.05	.05	.10
s.d.	0	.15	.15	.20
t-value	-1.00		-.60	

Note. N=10 for each group.

*p<.10
**p<.05
***p<.02
****p<.01
*****p<.002

Table 17. Extreme-Groups, BIADI residuals and NBOOKS, t-tests

	NBOOKS		BIADI Residuals	
	Most Effective	Least Effective	Most Effective	Least Effective
NS-T				
mean	2.10	3.80	3.00	3.40
s.d.	1.30	1.60	1.48	1.74
t-value	-2.47**		-.52	
EDCOM				
mean	12.30	12.30	11.30	12.80
s.d.	2.83	1.84	2.33	1.60
t-value	0		-1.59	
CAT				
mean	3.20	1.70	2.80	2.40
s.d.	1.47	1.42	1.33	1.85
t-value	2.20**		.53	
PHOMQ				
mean	26.40	21.40	23.40	22.50
s.d.	6.74	4.22	4.63	7.43
t-value	1.89*		.65	
PARI-DEN				
mean	79.80	79.90	82.00	82.30
s.d.	7.81	10.17	3.61	8.28
t-value	-.02		-.10	
PARI-ACC				
mean	29.10	30.10	28.20	30.60
s.d.	4.85	3.83	5.08	4.61
t-value	-.49		-1.05	
PARI-AUT				
mean	74.60	71.10	73.90	68.50
s.d.	7.98	9.40	5.73	7.02
t-value	.85		1.79*	
ESVII-E				
mean	4.80	4.86	4.87	4.76
s.d.	.81	.58	.94	.54
t-value	-.19		.31	
CARCOHAB				
mean	1.11	1.20	1.15	1.22
s.d.	.07	.11	.10	.12
t-value	-2.03*		-1.31	
16PF-A				
mean	5.10	4.90	5.70	5.10
s.d.	1.64	2.07	2.37	1.45
t-value	.23		.65	
16PF-E				
mean	5.10	5.60	5.60	5.90
s.d.	1.70	2.06	.92	1.70
t-value	-.56		-.47	
16PF-F				
mean	5.90	5.20	6.10	5.00
s.d.	1.70	1.08	1.58	1.18
t-value	1.04		1.67	
16PF-H				
mean	6.00	4.90	6.40	5.40
s.d.	1.34	1.58	1.28	1.74
t-value	1.59		1.39	
16PF-I				
mean	5.60	5.20	6.00	4.80
s.d.	1.96	1.94	1.84	1.38
t-value	.44		1.38	
16PF-Q4				
mean	4.40	5.40	5.30	5.10
s.d.	1.50	1.36	1.19	1.70
t-value	-1.49		.29	
16PF-DEQ3				
mean	6.13	5.49	5.86	5.36
s.d.	2.02	2.11	1.86	1.41
t-value	.66		.64	
TSC-PERS				
mean	66.70	62.50	66.20	67.80
s.d.	5.27	9.24	7.53	9.31
t-value	1.18		-.40	
TSC-PAM				
mean	69.30	68.70	72.30	72.70
s.d.	6.90	7.62	6.94	7.36
t-value	.18		-.12	
TSOR-RAPOAB ($\overline{S_1+S_2}$)				
mean	3.22	3.27	3.33	3.08
s.d.	.48	.44	.35	.68
t-value	-.74		1.00	
TSOR-STRUAB ($\overline{S_1+S_2}$)				
MEAN	3.44	3.71	3.55	3.63
s.d.	.43	.34	.43	.24
t-value	-1.45		-.43	
TSOR-PER ($\overline{S_1+S_2}$)				
mean	.95	.55	.50	.70
s.d.	.85	.61	.77	.68
t-value	1.15		-.58	
TSOR-PSR ($\overline{S_1+S_2}$)				
mean	4.70	4.70	4.55	4.65
s.d.	.75	1.03	.93	.71
t-value	0		-.26	
TSOR-AD ($\overline{S_1+S_2}$)				
mean	.35	.15	.25	.70
s.d.	.55	.32	.51	1.47
t-value	.94		-.87	
TSOR-CCD ($\overline{S_1+S_2}$)				
mean	2.70	3.55	2.70	2.50
s.d.	1.27	1.01	1.12	1.07
t-value	-1.57		.39	
TSOR-IGN ($\overline{S_1+S_2}$)				
mean	.15	.15	0	.15
s.d.	.32	.23	0	.23
t-value	0		-1.96*	

Note. N=10 for each group.

*pc.10
**pc.05

Table 18. Extreme-Groups, BIADII and SEI Residuals, t-Tests

	BIADII Residuals		SEI Residuals	
	Most Effective	Least Effective	Most Effective	Least Effective
SME-T				
mean	2.50	3.40	2.80	2.90
s.d.	1.57	1.62	1.54	1.51
t-value	-1.20		-.14	
EDCOH				
mean	13.60	12.90	14.10	12.10
s.d.	2.29	2.21	2.17	2.66
t-value	.66		1.75*	
CAT				
mean	2.30	2.20	2.60	2.80
s.d.	1.35	1.72	1.62	1.72
t-value	.14		-.25	
PHONQ				
mean	24.70	24.60	29.60	23.70
s.d.	5.81	8.79	6.62	6.17
t-value	.03		1.96*	
PARI-DEM				
mean	82.00	78.00	82.20	78.20
s.d.	8.90	9.77	8.08	5.83
t-value	.91		1.20	
PARI-ACC				
mean	29.30	29.80	29.10	28.30
s.d.	3.07	4.62	3.75	5.06
t-value	-.27		.38	
PARI-AUT				
mean	70.90	70.10	72.30	67.90
s.d.	7.11	5.41	4.86	6.85
t-value	.27		1.57	
RSVII-B				
mean	4.97	4.72	4.44	4.45
s.d.	.63	.61	.62	.36
t-value	.84		-.89	
CARCOMAB				
mean	1.19	1.38	1.33	1.21
s.d.	.63	.61	.62	.36
t-value	-1.09		.94	
16PF-A				
mean	5.60	5.30	4.10	4.20
s.d.	1.80	3.10	1.30	1.89
t-value	.25		-.13	
16PF-F				
mean	5.30	5.10	4.90	4.90
s.d.	1.90	1.22	1.70	1.58
t-value	.27		0	
16PF-F				
mean	5.00	5.20	5.10	4.80
s.d.	1.10	1.25	1.64	1.08
t-value	-.36		.46	
16PF-H				
mean	5.90	5.20	5.40	5.10
s.d.	2.30	1.25	.92	2.17
t-value	.80		.38	
16PF-I				
mean	5.10	4.50	5.30	5.30
s.d.	1.70	1.20	1.62	1.73
t-value	.86		0	

	BIADII Residuals		SEI Residuals	
	Most Effective	Least Effective	Most Effective	Least Effective
16PF-Q4				
mean	4.40	5.30	5.60	4.80
s.d.	1.11	1.10	1.56	1.54
t-value	-1.72		1.10	
16PF-DSQ3				
mean	5.44	5.08	5.26	4.63
s.d.	1.65	1.27	1.05	1.87
t-value	.52		.88	
TSC-PERS				
mean	64.40	67.40	65.30	65.30
s.d.	9.17	7.74	6.60	8.28
t-value	-.75		.00	
TSC-FAM				
mean	68.00	71.20	71.90	68.40
s.d.	9.08	10.51	7.58	9.29
t-value	-.69		.88	
TSOR-RAPOAP ($\overline{S_1+S_2}$)				
mean	3.06	3.23	3.30	3.10
s.d.	.70	.47	.47	.41
t-value	-.59		.96	
TSOR-STRUAB ($\overline{S_1+S_2}$)				
mean	3.54	3.50	3.76	3.47
s.d.	.34	.32	.38	.34
t-value	.29		1.73*	
TSOR-PHR ($\overline{S_1+S_2}$)				
mean	1.05	.40	.60	.75
s.d.	.82	.49	.70	.78
t-value	2.04*		-.43	
TSOR-PSR ($\overline{S_1+S_2}$)				
mean	4.70	4.35	4.85	3.90
s.d.	.84	.71	.55	.70
t-value	.95		3.20**	
TSOR-AD ($\overline{S_1+S_2}$)				
mean	.80	.55	.45	.20
s.d.	1.49	.52	.52	.40
t-value	.48		1.14	
TSOR-CCD ($\overline{S_1+S_2}$)				
mean	2.75	2.30	2.50	3.30
s.d.	1.01	1.21	.84	1.20
t-value	.86		-1.71	
TSOR-IGN ($\overline{S_1+S_2}$)				
mean	.10	.15	.10	.15
s.d.	.30	.23	.30	.23
t-value	-.40		-.40	

Note. N=10 for each group.

*p<.10
**p<.01

Table 19. Extreme-Groups, SLOC Residuals, t-Tests

	SLOC Residuals: Most Effective		SLOC Residuals: Least Effective
SKE-T			
mean	2.60		3.80
s.d.	1.36		1.94
t-value		-1.52	
EDCOM			
mean	12.10		12.40
s.d.	1.76		2.37
t-value		-.30	
CAT			
mean	2.50		3.50
s.d.	1.36		1.69
t-value		-1.38	
PHONQ			
mean	23.80		23.20
s.d.	4.19		7.88
t-value		.20	
PARI-DEM			
mean	81.10		83.00
s.d.	6.56		8.71
t-value		.55	
PARI-ACC			
mean	32.00		29.20
s.d.	3.93		3.60
t-value		-1.57	
PARI-AUT			
mean	70.60		76.60
s.d.	6.89		7.16
t-value		1.81*	
ESVII-B			
mean	4.89		4.71
s.d.	.92		.69
t-value		.47	
CARCOMAB			
mean	1.23		1.22
s.d.	.34		.16
t-value		.08	
16PF-A			
mean	5.10		5.00
s.d.	1.64		2.00
t-value		.12	
16PF-E			
mean	4.30		5.30
s.d.	1.49		1.55
t-value		-1.40	
16PF-F			
mean	5.10		5.20
s.d.	1.58		1.83
t-value		-.12	
16PF-H			
mean	5.80		6.40
s.d.	1.33		1.96
t-value		-.76	
16PF-I			
mean	6.40		4.20
s.d.	1.69		1.08
t-value		3.30*	

	SLOC Residuals: Most Effective		SLOC Residuals: Least Effective
16PF-Q4			
mean	4.60		4.90
s.d.	.92		1.45
t-value		-.53	
16PF-DSQ3			
mean	4.72		6.09
s.d.	1.16		2.24
t-value		-1.63	
TSC-PERS			
mean	66.30		68.10
s.d.	9.04		6.43
t-value		-.76	
TSC-PAH			
mean	71.90		73.30
s.d.	6.66		5.98
t-value		-.47	
TSOR-RAPOAB ($\overline{S_1+S_2}$)			
mean	3.32		3.43
s.d.	.57		.49
t-value		-.44	
TSOR-STRUAB ($\overline{S_1+S_2}$)			
mean	3.71		3.71
s.d.	.42		.37
t-value		0	
TSOR-PHR ($\overline{S_1+S_2}$)			
mean	.25		.65
s.d.	.51		.50
t-value		-1.67	
TSOR-PSR ($\overline{S_1+S_2}$)			
mean	4.90		4.90
s.d.	.58		.97
t-value		0	
TSOR-AD ($\overline{S_1+S_2}$)			
mean	.05		.15
s.d.	.15		.32
t-value		-.85	
TSOR-CCD ($\overline{S_1+S_2}$)			
mean	2.55		3.15
s.d.	.96		1.45
t-value		-1.03	
TSOR-IGN ($\overline{S_1+S_2}$)			
mean	.05		.05
s.d.	.15		.15
t-value		0	

Note. N=10 for each group.

*p<.01

are presented in Table 20. A minus indicates that the least effective tutors scored higher on the variable, and a plus indicates that the most effective tutors scored higher on the variable. It can be seen that most of the tutor variables distinguished between most and least effective tutors for only one of the dependent measures. However, six of them (SES-T, EDCOM, CAT, PHONQ, PARI-AUT, and 16PF-DSQ3) were significantly different for the two groups for two, three or four dependent variables.

Summary

When the groups of most and least effective tutors were compared, different patterns of tutor variables differentiated between the two groups for various dependent variables, just as different patterns contributed to the various criterion variables in the regression analyses. Furthermore, the extreme-groups analyses revealed that different tutors were most and least effective for different dependent variables, presumably because they possessed varying combinations of the distinguishing characteristics and behaviors.

The low correlations between the tutors two students' scores for all the dependent variables were surprising. Apparently a tutor's effectiveness with one student says essentially nothing about her or his success with another.

The results of the t-tests revealed that the most effective tutors for GOR were most often parents and teachers who were accepting, indulgent, humble, serious, and sensitvely emotional. The most effective tutors for GS knew more phonics and again were sensitively emotional. The most effective tutors for SORT had completed more years of education and were from higher socioeconomic levels, while those for VMI were most often high school and college students, teacher aides and adults other than parents and teachers who knew more phonics, who were more democratic, and who frequently expressed aversive disapproval and seldom expressed calm, constructive disapproval during tutoring. The most effective tutors for NBOOKS were also most often high school and college

Table 20. Summary of Significant t-Test Results: Tutor Variables on which Most and Least Effective Tutors Differed, Direction of Differences, and Significance Levels

Tutor Variable	GOR		GS		SORT		VMI		NBOOKS		BIADI		BIADII		SEI		SLOC		TOT[a]
	+/-	p	+/-	p	+/-	p	+/-	p	+/-	p	+/-	p	+/-	p	+/-	p	+/-	p	
SES-T					-	.05			-	.05									2
EDCOM					+	.10									+	.10			2
CAT	-	.10					+	.002	+	.05									3
PHONQ			+	.10			+	.02	+	.10					+	.10			4
PARI-DEM							+	.10											1
PARI-ACC	+	.02																	1
PARI-AUT	-	.10									+	.10					+	.01	3
CARCOMAB									-	.10									1
16PF-E	-	.02																	1
16PF-F	-	.01																	1
16PF-I																	+	.01	1
16PF-DSQ3	-	.01	-	.10															2
TSC-PERS	+	.10																	1
TSOR-STRU															+	.10			1
TSOR-PMR													+	.10					1
TSOR-PSR															+	.01			1
TSOR-AD							+	.10											1
TSOR-CCD							-	.01											1
TSOR-IGN											-	.10							1

Note. A plus (+) indicates that the most effective tutors scored higher on the variable, and a minus (-) indicates that the least effective tutors scored higher on the variable.

[a] This column represents the total number of dependent variables for which the tutor variable significantly differentiated between most and least effective tutors.

students, teacher aides and adults other than parents and teachers who knew more phonics; they were from higher socioeconomic levels and were less able to communicate empathy. The BIADI most effective tutors believed in fostering autonomy and seldom ignored student bids for attention during tutoring, while BIADII most effective tutors frequently used positive material reinforcement. The most effective tutors for increasing SEI had completed more years of education, knew more phonics, had more structured tutoring sessions and frequently used positive social reinforcement. For the SLOC, the tutors whose students became more internal were sensitive and dependent and believed in fostering autonomy.

None of the tutor variables characterized the effective tutors for all the dependent variables. However, the effective tutors for SORT and NBOOKS were from significantly higher SES levels, and the observed differences for SES-T were in the same direction for all other dependent variables. Similarly, effective tutors for GS, VMI, NBOOKS, and SEI had significantly higher PHONQ scores; the observed PHONQ differences were in the same direction for all the other dependent variables except SORT, where they differed by .2 points. Higher SES tutors who had a better knowledge of phonics were consistently in the most effective groups.

DISCUSSION

The results of this study cannot be easily summarized to identify the characteristics and behaviors of the most effective tutors. Not only were the tutor variables associated with student progress different for the various dependent variables, but they were also different for the same dependent variable when one compared the regression analyses and extreme-groups results. One possible conclusion is that apparently the type of tutor who is effective depends to some extent on the type of student behavior being measured. The

tutor characteristics and behaviors which were found in this study to significantly contribute to the predictions of the dependent variables in the regression analyses and to significantly differentiate between the groups of most and least effective tutors for the nine dependent variables are presented in Table 21. One should remember while reading this table that in the regression analyses the contributions of these variables were small and in the extreme-groups analyses the t-values of the differences were small. Thus, while all the relationships were statistically significant, their practical significance is not as clear.

Previous studies have found conflicting results for the relationship of age and educational level of the tutors to student achievement. The present study found that age was not related to performance on any of the dependent variables, but that educational level was positively related to gains in word recognition and self-esteem. The relationship with word recognition was in the opposite direction from that found by Hamblin & Hamblin (1972). However, they compared kindergarten and teenage tutors while in the present study the high school students, or teenagers, were the tutors with the lowest educational levels. The teenagers were the less effective tutors for word recognition achievement when compared with the kindergarten peer tutors and with high school and college educated adults.

The literature also contains conflicting opinions about the importance of the tutor's subject matter competency. Advocates of cross-age tutoring designed to benefit the tutors (e.g., Bloom, undated; Gartner et al., 1971) argue that students are helped as well by low-achieving tutors as by more competent ones. Writers who have been less concerned with tutor benefits (e.g., Butts & Sanders, 1972; Payne, 1967) have insisted that adequate subject matter knowledge

Table 21. Significant Tutor Variables Found in the Regression and Extreme-Groups Analyses

Tutor Predictor Variables Found in Regression Analyses	Most Effective Tutor Variables Found in Extreme-Groups Analyses
Dependent Variable: GOR Residual	
1. Degree of traditional attitudes about education (ESVII-B)	1. Higher proportion of parents and teachers (CAT)
2. Degree of assertiveness (16PF-E)	2. More accepting attitudes towards children (PARI-ACC)
3. Degree of tenseness (16PF-Q4)	3. More indulgent attitudes about child-rearing (PARI-AUT)
4. Feelings of personal adequacy (TSC-PERS)	4. Less assertive, dominant personality (16PF-E)
	5. More sober, dependable personality (16PF-F)
	6. More sensitive, emotional personality (16PF-DSQ3)
	7. Stronger feelings of personal adequacy (TSC-PERS)
Dependent Variable: GS Residual	
1. none	1. More knowledge of phonics (PHONQ)
	2. More sensitive, emotional personality (16PF-DSQ3)
Dependent Variable: SORT Residual	
1. Degree of venturesome spontaneity (16PF-H)	1. Higher SES level (SES-T)
2. Frequency of use of calm constructive disapproval (TSOR-CCD)	2. More years of education completed (EDCOM)
Dependent Variable: VMI Residual	
1. Proportion of parents, teachers, college students, high school students, and teacher aides (CAT)	1. Higher proportion of high school and college students, teacher aides, and adults other than parents and teachers (CAT)
2. Degree of sober dependability (16PF-F)	2. More knowledge of phonics (PHONQ)
	3. More democratic attitudes about child-rearing (PARI-DEM)
	4. More frequent use of aversive disapproval (TSOR-AD)
	5. Less frequent use of calm constructive disapproval (TSOR-CCD)
Dependent Variable: MBOOKS	
(TUTOR Analysis)	1. Higher SES level (SES-T)
1. Knowledge of phonics (PHONQ)	2. Higher proportion of high school and college students, teacher aides, and adults other than parents and teachers (CAT)
2. Degree of sober dependability (16PF-F)	
(COMBO Analysis)	3. More knowledge of phonics (PHONQ)
1. Degree of rapport during tutoring (TSOR-RAPOAB)	4. Less ability to communicate empathy (CARCOMAB)
Dependent Variable: BIADI Residual	
1. Frequency of use of ignoring (TSOR-IGN)	1. Stronger belief in fostering autonomy during childrearing (PARI-AUT)
	2. Less frequent use of ignoring (TSOR-IGN)
Dependent Variable: BIADII Residual	
1. Degree of tenseness (16PF-Q4)	1. More frequent use of positive material reinforcement (TSOR-PMR)
2. Degree of democratic attitudes about child-rearing (PARI-DEM)	
3. Feelings of adequacy as a family member (TSC-FAM)	
4. Use of positive material reinforcement (SR-UMR)	
5. Degree of outgoing adaptability (16PF-A)	
Dependent Variable: SEI Residual	
(TUTOR Analysis)	1. More years of education completed (EDCOM)
1. Number of years of education completed (EDCOM)	
2. Degree of belief in fostering autonomy during childrearing (PARI-AUT)	2. More knowledge of phonics (PHONQ)
3. Degree of sensitive emotionality (16PF-DSQ3)	3. More structured tutoring sessions (TSOR-STRUAB)
(COMBO Analysis)	4. More frequent use of positive social reinforcement (TSOR-PSR)
1. Frequency of use of aversive disapproval (TSOR-AD)	
2. Degree of sensitive emotionality (16PF-DSQ3)	
Dependent Variable: SLOC Residual	
1. Degree of sensitivity and dependency (16PF-I)	1. More sensitive, dependent personality (16PF-I)
2. Level of socioeconomic status (SES-T)	2. Stronger belief in fostering autonomy during childrearing (PARI-AUT)
3. Degree of accepting attitudes toward children (PARI-ACC)	
4. Frequency of use of aversive disapproval (TSOR-AD)	
5. Frequency of use of positive material reinforcement (TSOR-PMR)	

is a basic necessity for student improvement. In the present study, the tutors' knowledge of phonics was found to be significantly and positively related to student improvement in oral spelling, copying geometric forms, self-esteem, and to the number of tutoring books completed. The observed differences between PHONQ scores of the most and least effective tutors favored the most effective group for all dependent variables, except word recognition where the most effective tutors scored an average of .2 points less than the least effective group. Tutors' subject-matter knowledge was consistently positively related to desired student outcomes.

Little information could be found in the previous literature on the relationship of tutors' SES with student achievement. The present study found that the most effective tutors were consistently the higher SES tutors for all dependent variables. The relationship between tutor SES and student performance was significant for word recognition and the number of books completed.

The personality characteristics of an effective tutor have been the subject of much speculation, but less study. Many desirable characteristics have been mentioned. The present results indicated that different tutor personality characteristics were related to student achievement, depending on the type of achievement being measured. Only four characteristics were significantly related to achievement for more than one dependent variable; attitudes about the importance of fostering autonomy in children, dependability, the degree of tenseness, and sensitive emotionality. While these results certainly do not define the effective tutor personality, they do indicate directions for further study and suggest the complexity of the relationship between tutor personality and student achievement.

The one desirable tutor characteristic listed most frequently as essential to effective tutoring has been empathy or the ability to establish rapport.

Numerous tutoring programs have emphasized the importance of selecting tutors who have this ability (e.g., Cloward, 1967; Shaver & Nuhn, 1968, 1971).

In the present study, tutor empathy and rapport were significantly related to only one dependent variable, the number of tutoring books completed; however, the NBOOKS most effective tutors communicated significantly less empathy than the least effective tutors. It is possible that the lack of significant relationships with the other dependent variables was due to the limited range of empathy and rapport found among the tutors. The tutors had uniformly low scores on communication of empathy and uniformly moderate scores on degree of rapport. It is also possible that the moderate, rather than high, rater-agreement coefficients indicate that the observers were not accurately recording the degree of rapport exhibited during tutoring. If higher levels of empathy had been represented among the tutors or if more accurate observations had been recorded, a greater number of significant relationships between empathy or rapport and student achievement might have been found. However, the negative direction of the relationship for empathy is surprising and perhaps suggests that empathy and rapport may not be as desirable for producing student achievement as many people believe.

The previous literature indicated that higher student achievement frequently has resulted in programs that use highly structured materials and that have tutors whose instructional behaviors are based on principles of learning.

The program at which the present study was conducted used fairly structured materials and suggested that the tutors use reinforcement and corrective feedback procedures and avoid punitiveness, although the tutors were not precisely trained in these procedures. The observer ratings of the tutors' behavior produced some surprising, as well as expected results. The tutors who were rated as most closely following the structured materials were associated with

greater student improvement only for the measure of self-esteem. This finding for self-esteem is not surprising (e.g., see Coopersmith, 1967), although the absence of significant relationships between structure and the academic measures is. It is possible, however, since the materials were rather highly structured and no tutors failed to follow the lessons at all, that the variability in structure which produced its relationship with achievement in previous studies was not present in this group of tutors.

The present study also found that the use of reinforcement was not consistently related to greater student improvement. The use of positive social reinforcement was positively related only to increased self-esteem. The use of positive material reinforcement was positively related only to one measure of auditory discrimination and was a significant predictor only of changes in locus of control.

The results for the use of aversive disapproval, calm disapproval, and ignoring were puzzling. The use of aversive disapproval was a significant predictor of student changes in self-esteem and locus of control; the use of calm disapproval and ignoring were significant predictors of student improvement on the SORT and one test of auditory discrimination, respectively. However, the directions of the significant differences found in the extreme-groups analyses were opposite from what was expected. The students who improved the most in copying geometric forms had tutors who more frequently used aversive disapproval and less frequently used calm disapproval. The students who improved the most on the one test of auditory discrimination had tutors who less frequently ignored the students' bids for attention or attempts to get off task. It is possible that the observers were not correctly recording these behaviors; however, that seems unlikely since they are fairly easy to recognize.

There is no readily apparent explanation for these relationships.

In summary, the results of this study have raised more questions than they have answered, suggesting possible areas for additional study. Two findings of this study were of particular note. One, an interesting regression analysis result was that 15% of the posttest measure of locus of control could be attributed to tutor variables, considerably more than for any of the achievement measures. Since the initial locus of control measure contributed to the explanation of two student achievement variables in the COMBO analysis and four achievement variables in the STUDENT analysis, it is possible that changes in student locus of control during tutoring could positively affect future student performance.

Two, as mentioned earlier, higher-SES tutors who had a better knowledge of phonics were consistently in the most effective tutor groups. This observation suggests that SES and knowledge of subject matter do make a difference in tutoring effectiveness.

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Glossary

Dependent Variables

1. GORPRE - pretest
   GORPOS - posttest
   Gates-McKillop Reading Diagnostic Tests, Oral Reading Test, grade equivalents

2. GSPRE - pretest
   GSPOS - posttest
   Gates-McKillop Reading Diagnostic Tests, Spelling Test, grade equivalents

3. SORPRE - pretest
   SORPOS - posttest
   Slosson Oral Reading Test, grade equivalents

4. VMIPRE - pretest
   VMIPOS - posttest
   Developmental Test of Visual-Motor Integration, age equivalents (months)

5. BIADIPRE-pretest
   BIADIPOS-posttest
   Black's Informal Auditory Discrimination Test, Level I (scale=0-53)

6. BIADIIPRE-pretest
   BIADIIPOS-posttest
   Black's Informal Auditory Discrimination Test, Level II (scale=0-98)

7. WBOOKS -
   Number of Patterns for Progress tutoring books completed (total=10)

8. SEI
   SEIPRE - pretest
   SEIPOS - posttest
   Coopersmith Self-Esteem Inventory/ self-esteem score (scale=0-50)
   SEILE - pretest
   SEILO - posttest
   lie defensiveness score (scale=0-8) (high score=low defensiveness)

9. SLOCPRE- pretest
   SLOCPOS- posttest
   Nowicki-Strickland Locus of Control Scale for Children (scale=0-40) (high score=external LOC)

Independent Variables

Student Characteristics

1. AGE-S — age in months
2. SEX-S — sex (female=1, male=2)
3. SCHOOL — school system in which student was regularly enrolled (5 systems coded 1-5)
4. GRADE — grade just completed (range=1-7)
5. PARENT — number of parents at home
6. SIB — number of siblings
7. BO — birth order among siblings
8. MED — student on medication such as Ritalin during the program (yes=1, no=2)
9. RPC — number of previous Reading Progress Center programs attended
10. SES-S — socioeconomic status of student's family (range=1-6) (high score=low SES)
11. NDA-S — number of days absent
12. SIT — Slosson Intelligence Test IQ

Tutor Characteristics

1. AGE-T — age
2. SEX-T — sex (female=1, male=2)
3. MS — marital status (single=1, married=2, divorced=3, widowed=4)
4. SES-T — socioeconomic status of tutor or tutor's family (range=1-6) (high score=low SES)
5. EDCOM — years of education completed
6. CAT — tutor category: parent of child in RPC=1, teacher=2, college student=3, high school student=4, teacher aide=5, adult volunteer=6
7. EXPER — number of previous RPC programs in which tutor had worked
8. NCHILD — number of tutors own children in RPC
9. NDA-T — number of days absent
10. PHONQ — phonics quiz (scale=0-50)
11. PARI — revised Parent Attitude Research Instrument, attitudes about dimensions of child-rearing
    - PARI-DEM — democracy (scale=25-100)
    - PARI-ACC — acceptance (scale=10-40)
    - PARI-AUT — autonomy (scale=27-108)
12. CARKHUFF — Carkhuff Scales for Assessment of Interpersonal Functioning, Scale 1, Empathic Understanding (scale=1-5)
    - CARCOM-A — communication of empathy (Rater A)
    - CARCOM-B — communication of empathy (Rater B)
    - CARCOM-AB — communication of empathy (mean)
    - CARDIS — discrimination of empathy
13. ESVII — Education Scale VII-attitudes toward education
    - ESVII-A — degree of progressivism (scale=1-7)
    - ESVII-B — degree of traditionalism (scale=1-7)
    - ESVII-A-B — degree and consistency of attitudes (scale=0-6)
14. TLOC — locus of control Rotter I-E Scale (scale=0-23), high score=external LOC)
15. 16PF — Sixteen Personality Factor Questionnaire, sten scores, high score description on right
    - 16PF-A — Factor A — Reserved-Outgoing
    - 16PF-B — Factor B — Less Intelligent-More Intelligent
    - 16PF-C — Factor C — Affected by feelings-Emotionally Stable
    - 16PF-E — Factor E — Humble-Assertive
    - 16PF-F — Factor F — Sober-Happy-go-lucky
    - 16PF-G — Factor G — Expedient-Conscientious
    - 16PF-H — Factor H — Shy-Venturesome
    - 16PF-I — Factor I — Tough-minded-Tender-minded
    - 16PF-L — Factor L — Trusting-Suspicious
    - 16PF-M — Factor M — Practical-Imaginative
    - 16PF-N — Factor N — Forthright-Shrewd
    - 16PF-O — Factor O — Self-assured-Apprehensive
    - 16PF-Q1 — Factor Q_1 — Conservative-Experimenting
    - 16PF-Q2 — Factor Q_2 — Group-dependent-Self-sufficient
    - 16PF-Q3 — Factor Q_3 — Undisciplined self-conflict-Controlled
    - 16PF-Q4 — Factor Q_4 — Relaxed-Tense
    - 16PF-DSQ1 — Derived Score Q_I — Introversion-Extroversion
    - 16PF-DSQ2 — Derived Score Q_{II} — Low Anxiety-High Anxiety
    - 16PF-DSQ3 — Derived Score Q_{III} — Tenderminded Emotionality-Tough Poise
    - 16PF-DSQ4 — Derived Score Q_{IV} — Subduedness-Independence
16. TSC — Tennessee Self Concept Scale
    - TSC-PHY — physical self
    - TSC-ME — moral-ethical self
    - TSC-PERS — personal self
    - TSC-FAM — family self
    - TSC-SOC — social self
    - (physical self, moral-ethical self, personal self, family self, social self: scale=0-90)
    - TSC-IDEN — identity ("what I am") (scale=0-150)
    - TSC-SAT — self satisfaction ("how I feel about myself") (scale=0-150)
    - TSC-BEH — behavior ("what I do") (scale=0-150)
    - TSC-TOT — total self-esteem (scale=0-450)
    - TSC-SC — self criticism-degree of defensiveness (scale=0-30, high score=low defen.)

Tutor Behaviors

1. TSOR — tutor-student observation rating
    - TSOR-RAPO — observation rating of rapport (1-5)
    - TSOR-RAPOA — rapport-observer A
    - TSOR-RAPOB — rapport-observer B
    - TSOR-RAPOAB — rapport-mean
2. TSOR-STRU — observation rating of structure (1-5)
    - TSOR-STRUA — structure-observer A
    - TSOR-STRUB — structure-observer B
    - TSOR-STRUAB — structure-mean
3. TSOR-PMR — observed frequency of tutor's use of positive material reinforcement (total frequency-observers A & B)
4. TSOR-PSR — observed frequency of tutor's use of positive verbal and nonverbal social reinforcement (total frequency-observers A & B)
5. TSOR-AD — observed frequency of tutor's use of aversive disapproval (total frequency-observers A & B)
6. TSOR-CCD — observed frequency of tutor's use of calm constructive disapproval (total frequency-observers A & B)
7. TSOR-IGN — observed frequency of tutor's use of ignoring student's bid for attention (total frequency-observers A & B)
8. SR-UMR — Supervisor's report of whether the tutor at any time used material reinforcement (yes=1, no=2)
9. SRTC — Supervisor's end of program rating of tutor's creativity (1-5)